

Commentary

The sequence of care – do new methods warrant a shift from the standard ABC to a CABC approach?

Steve Whitfield BParamedPract, GradDipStrategicLeadership, DipSecurityRiskMgt, is a lecturer in paramedicine¹

Affiliation:

¹Griffith University, School of Medicine, Queensland

<https://doi.org/10.33151/ajp.16.698>

Abstract

Adaptions and change are vital to the development of pre-hospital care. Emerging evidence-based practices ensure best patient care. The Airway, Breathing, Circulation (ABC) sequence of care in pre-hospital environment is ignoring a vital step in trauma support. This commentary provides an evidence-based discussion and explores the appropriateness of the current ABC sequence of care.

Keywords:

primary survey; ABC algorithm; pre-hospital; paramedicine; emergency medical technician (EMT); emergency medical service (EMS)

Corresponding Author: Steve Whitfield, stevewhitfield4@gmail.com

Introduction

Throughout modern history paramedics have been at the forefront of emergency scene management and responsible for rapid scene evaluation, patient assessment and care plan delivery to preserve life (1-3). The practice of a systematic approach has been fundamental in mitigating hazardous circumstances on scene and the historical usage of acronyms such as DRABC (Danger, Response, Airway, Breathing, Circulation) has provided an aide memoir to assist the clinician deliver optimal pre-hospital care (1-3). The author acknowledges that the 'D' danger and 'R' response steps of the primary survey may differ between services. Where some refer to a 'scene size up', a responder is expected to assess 'D' danger and many also refer to 'general impression' where a responder assesses 'R' the patient's level of consciousness. For the purpose of cross-service rationalisation these explanations have been included here.

The ABC approach to the primary survey is one of the most widely used approaches to the initial emergency care for both pre-hospital and in-hospital care internationally. The ABC approach has three advantages: life threatening information is collected rapidly; information is collected in relation to perceived clinical importance; and it is an easy to remember and well-known acronym for ease of practice (1-3).

Ultimately this approach has been a central aspect of paramedic practice since it was first conceived for resuscitation by Peter Safar in 1957 (4). The ABC approach remained relatively unchanged until 1976 when James Styner pioneered the advanced trauma life support program with the addition of D (Disability) and E (Exposure) (5). The 'ABCDE' approach has established itself among both pre-hospital and hospital emergency department algorithms since the mid 1970s (1,5). Although the acronym is still widely accepted as the foundation for advanced life support initial assessment, pre-hospital clinicians have found inconsistencies and conflicts with contemporary views on perceived clinical priorities in relation to trauma (3,6,7). This article aims to provide a timely discussion using relevant literature that suggests a shift in the pre-hospital ABC approach is reasonable and warranted.

Discussion

Regrettably, medical advances in pre-hospital trauma management advance during times of military conflict or following large-scale terror attacks. Through the recent conflicts in Iraq and Afghanistan, or attacks such as the Boston bombings, some dramatic changes in trauma algorithms have been proposed (3,8). Research suggests that an estimated 10% of all battlefield deaths during these conflicts were associated with massive haemorrhage due to extremity injuries (8). As early as 2001 arterial tourniquets – although

actively discouraged by medical professionals – were being improvised by soldiers on the ground to prolong life (3,8,9). A study between 2001 and 2010 demonstrated that only 30% of limb related injuries were provided a tourniquet and yet the study presented a dramatic increase in usage during the last half of the study time (8). It went on to demonstrate that the rates of survival were directly proportionate to the increase in rates of early tourniquet usage in extremity injury (8). These findings warrant a necessary review of emergency trauma algorithms, particularly the ABC approach which fails to identify catastrophic haemorrhage control as an early life saving measure worthy of rapid consideration and action (3,7).

Haemostatic dressings were made available to Australian soldiers as early as 2004 during the Iraq and Afghanistan conflicts and in 2009 the Israeli Defence Force made haemostatic dressings, for the purpose of wound packing, available to all medics (9-13). Remarkably, pre-hospital wound packing failed to achieve clinical endorsement within the Australian civilian ambulance setting until as late as 2018 (10-13). Changes in pre-hospital service delivery in Australia has recently seen the successful implementation of both the arterial tourniquet and wound packing into current practice, and yet the initial systematic approach reflected by the current Australian ambulance services – ABC – still fails to recognise catastrophic haemorrhage control as an early consideration within the primary survey algorithm (often haemorrhage control is towards the end of the algorithm) (12-13).

A comparison between trauma life support within the military and civilian context found the ABC approach largely defunct in the trauma setting (3,7,10). The aforementioned emphasis on airway (A) support has been demonstrated to contribute widely toward preventable battlefield deaths (3,7,10,11). These findings have caused a recent shift in clinical reasoning to decrease the poor outcomes of extremity injuries (3,7,10,11). Recommendations were made to place an emphasis on catastrophic haemorrhage (C) thus taking precedence over early airway management resulting in a catastrophic haemorrhage, airway, breathing, circulation (CABC) approach (3,14,15). The Tactical Emergency Casualty Care (TECC) approach has been derived from the Tactical Combat Casualty Care (TCCC) and are examples of shifting clinical priorities (16). Although tactical focussed, TECC is intended to balance clinical priorities in the civilian context and reduce preventable deaths through military medical lessons cultivated from the battlefield (16).

Further utilisation of the algorithmic approach MARCH (Massive haemorrhage, Airway, Respirations, Circulation, Hypothermia) has shown clinical priority towards managing a catastrophic haemorrhage over airway (17). A recent study demonstrated the MARCH approach to be a simple, reliable and effective mnemonic for medics approaching both battle and nonbattle-related injuries (17).

The rise of terror attacks on civilian populations have also contributed to the debate surrounding pre-hospital trauma recommendations and works are in progress to bring the civilian approach to trauma life support, in line with the military approach (3,14,15). Although a dynamic shift in ambulance services is required to implement an additional 'C' proceeding the ABC method, an 8-year study of the Boston Emergency Medical Service showed that an emphasis placed on catastrophic haemorrhage management was seamlessly implemented by both basic and advanced life support officers. The early management of catastrophic extremity haemorrhage in the study period presented infrequent complications and positive outcomes for trauma patients (18). Although the MARCH and CABC approach appear on face value dissimilar, both approaches places emphasis on the above mentioned shift in priorities (16,17).

Paradoxically, some pre-hospital services currently fail to recommend, or implement, a standard 'DR' (Danger Response) (Table 1) components in the primary survey, determining that the application of the ABCDE approach which is endorsed and utilised within the in-hospital emergency department context as sufficient for the pre-hospital setting (12-13). However, the occupational and uncontrolled nature of the pre-hospital setting in potentially hostile environments should warrant emphasis on provider safety as a priority thus encouraging 'DR' emphasis preceding 'CABC' (1,12,13).

Recommendations

In a report compiled by the Australian Trauma Quality Improvement Program (2012), pre-hospital trauma was identified as one of the leading causes of morbidity, mortality and permanent disability in Australia (15). New trauma management processes implemented by the Queensland Police following several operational incidents recently has seen

sweeping and rapid changes to the ambulance service delivery of trauma within Queensland (12). Paramedic access to chest seals and haemostatic dressings in both police and ambulance vehicles have seen a larger focus on trauma management and yet the standard ABC approach remains (12). Internationally, adaptations and alterations have modified the ABC approach to fit a diverse area in which it is currently used causing the ABC algorithm to become almost unrecognisable in some instances. However, the standard ABCDE approach is still widely accepted by experts internationally in emergency medicine (7,14,18,21).

There is some rhetoric debating trauma exposure in the civilian setting with discussion about the relevance existing between the military findings and the current civilian pre-hospital approach. A review of all current initial assessment methods employed by Australian ambulance services may have varying degrees of potential negative impact on severely injured patients in the civilian trauma setting (14-20). It is therefore a recommendation that a shift from the standard ABC approach to a CABC approach occurs within all civilian ambulance services to place emphasis on a rapid assessment for catastrophic haemorrhage before airway.

Although the recommendations made in this paper may be considered dissident, an outright rejection of the ABCDE versus CABC discussion will do little to stop death from catastrophic or severe haemorrhage in the pre-hospital setting (14-20). An emphasis on responder safety and stopping the bleeding early is of paramount importance to preserving life. A better understanding of how pre-hospital methods often evolve from the battlefield, will allow for a robust discussion concerning a best practice pre-hospital approach. This paper aims to continue that conversation and shift the current ABC approach methodologies based on current practice literature.

Table 1. Comparison of online resources available to the public showing primary surveys of Australian ambulance services and the emphasis on initial haemorrhage control

State service	Recommended approach	Comment
Victoria (13)	DRABCDE	Haemorrhage control is recommended in 'C' Circulation
Queensland (12)	DRABC or DRCAB	Haemorrhage control is recommended in 'C' Circulation, however the 'DRCAB' pathway is only recommended for medical cardiac arrest
New South Wales (21)	ABCDE	Haemorrhage control is recommended in 'C' Circulation. Danger assessment has been removed from the primary survey into a scene survey
Tasmania (22)	DRABCH	Haemorrhage control is recommended in 'H' Haemorrhage
Australia Capital Territory (23)	DRABCH	Haemorrhage control is recommended in 'C' Circulation. The additional 'H' is for 'history'
Northern Territory (24)	Standard cares	Standard cares are assumed
Western Australia	No online resource found	
South Australia	No online resource found	

Conflict of interest

The author declares no competing interests. The author of this paper has completed the ICMJE conflict of interest statement.

References

1. Johnson M, Boyd L, Grantham H, Eastwood K. Paramedic principles and practice ANZ. Elsevier; 2015, p. 36-8.
2. Fisher J, Brown S, Cooke M, et al. UK ambulance services clinical practice guidelines 2013. Bridgwater: Class Professional Publishing; 2013.
3. Hodgetts T, Mahoney P, Russell M, Byers M. ABC to <C>ABC: redefining the military trauma paradigm. *Emerg Med J* 2006;23:745-6.
4. Lenzer J. Peter Josef Safar. *BMJ* 2003;327:624.
5. Carmont M. The advanced trauma life support course: a history of its development and review of related literature. *Postgrad Med J* 2005;81:87-91.
6. Thim T, Krarup N, Grove E, Rohde C, Løfgren B. Initial assessment and treatment with the Airway, Breathing, Circulation, Disability, Exposure (ABCDE) approach. *Int J Gen Med* 2012;5:117-21.
7. Ferrada P, Callcut R, Skarupa D, et al. Circulation first – the time has come to question the sequencing of care in the ABCs of trauma; an American Association for the Surgery of Trauma multicenter trial. *World J Emerg Surg* 2018;13:8.
8. Kragh J, Dubick M, Aden J, et al. U.S. military use of tourniquets from 2001 to 2010. *Prehosp Emerg Care* 2014;19:184-90.
9. Welling D, McKay P, Rasmussen T, Rich N. A brief history of the tourniquet. *J Vasc Surg* 2012;55:286-90.
10. Shina A, Lipsky A, Nadler R, et al. Prehospital use of hemostatic dressings by the Israel Defense Forces Medical Corps. *J Trauma Acute Care Surg* 2015;79:S204-9.
11. Kragh J, Dubick M. Battlefield tourniquets: lessons learned in moving current care toward best care in an army medical department at war. *US Army Med Dep J* 2016;2:29-36.
12. Queensland Ambulance Service clinical practice manual. QAS; 2016. Available at: www.ambulance.qld.gov.au/clinical.html [Accessed 29 December 2018].
13. Clinical practice guidelines ambulance and MICA paramedics. Ambulance Victoria; 2018. Available at: www.ambulance.vic.gov.au/wp-content/uploads/2018/11/Clinical-Practice-Guidelines-2018-Edition-1.4.pdf [Accessed 29 December 2018].
14. Lee C, Porter K, Hodgetts T. Tourniquet use in the civilian prehospital setting. *Emerg Med J* 2007;24:584-7.
15. Response to the Australian Commission for Safety and Quality in Health Care on the Australian Safety and Quality Goals for Health Care – Consultation Paper. National Trauma Research Institute; 2012.
16. Shapiro G, Sarani B, Smith R. Tactical Emergency Casualty Care (TECC): principles and practice. In: Martin M, Beekley A, Eckert M, editors. *Front Line Surgery*. Springer, Cham; 2017 Available at: https://link.springer.com/chapter/10.1007/978-3-319-56780-8_41 [Accessed 16 April 2019].
17. Rush S, Kosequat J, Scott A, et al. Efficacy of the mnemonic device “MARCH PAWS” as a checklist for paramedics during tactical field care and tactical evacuation. Philadelphia: Philadelphia College of Osteopathic Medicine; 2018. Available at: https://digitalcommons.pcom.edu/cgi/viewcontent.cgi?article=1355&context=research_day [Accessed 16 April 2019].
18. Kue R, Temin E, Weiner S, et al. Tourniquet use in a civilian emergency medical services setting: a descriptive analysis of the Boston EMS experience. *Prehosp Emerg Care* 2015;19:399-404.
19. The Economist. Trauma medicine has learned lessons from the battlefield. 2017 Available at: www.economist.com/international/2017/10/12/trauma-medicine-has-learned-lessons-from-the-battlefield [Accessed 28 December 2018].
20. Mercier E, Cameron P, Smith K, Beck B. Prehospital trauma death review in the state of Victoria, Australia: a study protocol. *BMJ Open* 2018;8:e022070.
21. Protocols and pharmacology. Ambulance New South Wales; 2011. Available at: www.ambo.com.au/download/protocol_2011.pdf [Accessed 14 January 2019].
22. Clinical practice guidelines for paramedics and intensive care paramedics. Ambulance Tasmania; 2012. Available at: https://www.dhhs.tas.gov.au/__data/assets/pdf_file/0018/107334/A00_-_Ambulance_Tasmania_Clinical_Practice_Guidelines_for_Paramedics_and....pdf [Accessed 14 January 2019].
23. ACT Ambulance Service clinical management guidelines. ACT Ambulance Service. Available at: <http://esa.act.gov.au/actas/about-us/clinical-management-guidelines/> [Accessed 14 January 2019].
24. Clinical practice guidelines. St John Ambulance Northern Territory; 2013. Available at: www.stjohnnt.org.au/img/documents/clinical-manuals/CPG-HV23June2013.pdf [Accessed 14 January 2019].